



Project Flood Control Plan During Construction

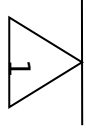
Project : High Speed Rail (Green Line) - Package (3) – 660 KM (Sokhna - Mattrouh)

Employer : The national authority for tunnels - NAT

Employer Representative : SYSTRA Group

Contractor : JV of Orascom Construction, The Arab Contractors and Elsewedy Electric for Power System Projects

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REVISION RECORD SHEET**Note**

- i. Revisions after Rev. 0 are denoted by a vertical line in the left-hand margin against the revised text, with the revision number displayed next to the revision line as shown by the example on the left.

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1.0 INTRODUCTION

This control plan presents a detailed flood control plan designed for a construction site located in an area known for high rainwater incidence. The plan is aimed at reducing flood risks, safeguarding resources, and ensuring the safety of all personnel while minimizing disruptions to construction activities.

1.1 Objectives

This plan is established, implemented, and maintained to:

- To proactively manage and mitigate flood risks at the construction site.
- To protect construction materials, equipment, and infrastructure from potential flood damage.
- To ensure the safety and well-being of all individuals on site.
- To minimize operational delays and financial losses due to flooding.

1.2 Scope

- The plan encompasses strategies for material storage, excavation activities, site access, working on temporary platforms, and the operation of heavy equipment along with the other normal daily activities conducted during construction phase.
- It is applicable to all construction site employees, contractors, subcontractors, and visitors
- It may be revised as per site requirements, based on the progress of the works and associated emergency scenarios.

1.3 Abbreviations and Definitions

Contractor	- JV of Orascom Construction, The Arab Contractors, and Elsewedy Electric for Power System Projects
ERT	- Emergency Response Team (trained team responding to the incident)
HSE	- Health, Safety and Environment
MSDS	- Material Safety Data Sheet
EMT	- Emergency Management Team (representatives of the Contractor responsible for coordinating major or severe incidents requiring external services.
PTW	- Permit To Work

2.0 RESPONSIBILITIES

2.1 Site Manager

- Oversees flood control plan implementation and coordinates with the ERT
- Make available all required resources and support for implementing this Plan.
- Act as a Project Emergency Response Manager, communicate the real-time response plan with the project stakeholders, emergency and local authority along with declaring a state of emergency.

2.2 HSE Manager

- Responsible for ensuring HSE compliance and regular HSE audits.
- Establish and lead the Emergency Response Team (ERT).
- Act as "Location Emergency Coordinator".
- Regularly review and update the Site Emergency Procedure.

- Coordinate with the project stakeholders and emergency service the flood control plan updates and requirement in order to get the required support to do so.

2.3 ERT Members

- Executes the emergency response plan and conducts rescue operations.
- Inspect the emergency equipment regularly.
- Conduct continuous training sessions for the emergency response plan for all personnel.
- Respond to emergency calls and coordinate the response.

2.4 All site personnel

- Must adhere to HSE guidelines and participate in emergency response drills
- Immediately evacuate areas adjacent to emergency locations and prevent entry of unauthorized personnel.
- Support emergency response measures, as directed by the Location Emergency Coordinator, ERT Members, and Contractor.

3.0 FLOOD RISK ASSESSMENT

The project management team is tasked with the crucial responsibility of establishing and implementing a comprehensive flood risk management plan. This process necessitates a collaborative approach, involving consultation and active participation from all project stakeholders. In addition to stakeholder input, the incorporation of expertise in flood risk management is vital. Together, these parties will work to identify potential flood risks and develop effective mitigation measures tailored to the specific needs of the project. It is essential that the results of these risk assessments are not static; they must be subject to regular validation to ensure their continued relevance and effectiveness. Based on these regular reviews, the flood risk management plan should be dynamically updated to reflect any changes in risk profiles or the efficacy of the mitigation strategies. This iterative process ensures that the plan remains robust and responsive to evolving flood risks, thereby safeguarding the project and its stakeholders.

- Analyze historical rainfall data and flood records to gauge the frequency and intensity of past flooding events in the local area. This review helps in understanding the typical patterns and severity of floods, providing valuable insights for future flood risk management.
- Evaluate the site's elevation, natural drainage patterns, and vulnerability to water accumulation. This assessment involves examining the terrain's topography and how it influences water flow and retention, crucial for understanding the site's flood risk.
- Develop flood models and maps for construction areas to identify potential flood locations and their severity. This process involves using simulation techniques and historical data to predict flood-prone areas, which helps in planning effective flood prevention and mitigation strategies in these zones.
- Identify potential flood pathways and areas within the site that are at high risk of flooding involves analyzing the site's layout and features to determine where water is likely to flow or accumulate during heavy rainfall or flooding events.

- Evaluate and assess the potential consequences of flooding on essential parts of the construction site aims to understand how floodwaters might affect key areas and infrastructure, informing strategies to mitigate damage and ensure safety.
- Evaluate the impact of climate change on the construction areas to forecast future flood occurrences. This assessment involves analyzing how changing weather patterns and environmental conditions could increase the likelihood of flooding in these regions, aiding in proactive planning and risk mitigation.
- Evaluate internal factors such as liquid storage tanks and construction processes that require substantial amounts of water or liquids, along with the underground water table, which could contribute to the potential for flooding. This assessment is critical to understand how elements within the construction site itself might influence flood risks.

4.0 FLOOD CONTROL MEASURES

4.1 Corrective and Control

Measures

- Implement and utilize efficient drainage systems, elevated platforms, and suitable site grading to effectively control surface water which is designed to manage and redirect water flow, minimizing the risk of water accumulation and potential flooding on the site..
- Store materials on raised platforms or in areas of higher topography, ensure their protection with waterproof measures, and maintain a strategy for rapid relocation for safeguarding construction materials from water damage and enabling swift movement in case of flooding..
- Plan excavations during periods of lower rainfall to minimize water ingress, employ pumps for efficient removal of accumulated water, and reinforce the sides of excavations to ensure stability. This approach not only reduces the likelihood of water-related disruptions but also enhances the safety and integrity of the excavation sites. The use of pumps ensures any water that does accumulate can be quickly and effectively removed, maintaining a dry work environment. Additionally, stabilizing the sides of the excavations is crucial to prevent collapses or erosion, especially in wet conditions, thereby ensuring a safer and more efficient construction process..
- Using submersible pumps and water suction tankers to efficiently remove excess water, while hoses facilitate the transfer of water from flooded areas. Secure water channels are also essential, directing the flow of water away from critical areas, thus preventing build-up and potential flood damage. This method is crucial in maintaining manageable water levels, especially in regions prone to heavy rainfall, ensuring construction activities continue safely and without major water-related disruptions.
- Build using elevated, robust materials and incorporate effective drainage systems. This approach ensures structures are less susceptible to water damage and facilitates the efficient removal of excess water, enhancing overall flood resilience.

- Enhance models for flood resistance and create a rapid relocation strategy for equipment. This involves designing structures and systems that can withstand flooding while also having a contingency plan to swiftly move equipment to safety in case of a flood.
- Deploy measures such as sandbags and portable barriers to protect critical areas. Sandbags are versatile and can be placed to create temporary flood barriers or reinforce vulnerable points, like entrances and machinery areas. Portable barriers offer quick and adaptable flood defense by swiftly forming sturdy barriers against rising waters. Their ease of deployment and relocation make them valuable assets for dynamic flood protection.

4.2 Preventive measures

To assist in the prevention of the flood emergency, all subcontractors shall:

- Ensure that there are engineering studies for the station's locations and select sites with lower flood risk where possible.
- Ensure that roads, walkways & and passageways remain unobstructed from stored materials or any waste. In addition to allocating a safe location for the site assembly point.
- Ensure that all points of emergency access or egress are clear at all times
- Ensure that electrical control panels and switchgear remain locked and unobstructed at all times
- Ensure that maps are posted at the workplace showing first aid facilities, evacuation routes, fire points, spill kits, and assembly points and these are kept clean and visible.

4.3 Monitoring and Adaptation

- Regularly monitor weather forecasts and water levels in nearby water bodies.
- Continuously adapt and update the flood control measures based on the current weather conditions and progress of construction activities.
- Encourage feedback from the site personnel to improve the effectiveness of the flood control strategies.

5.0 EMERGENCY RESPONSE PROCEDURE

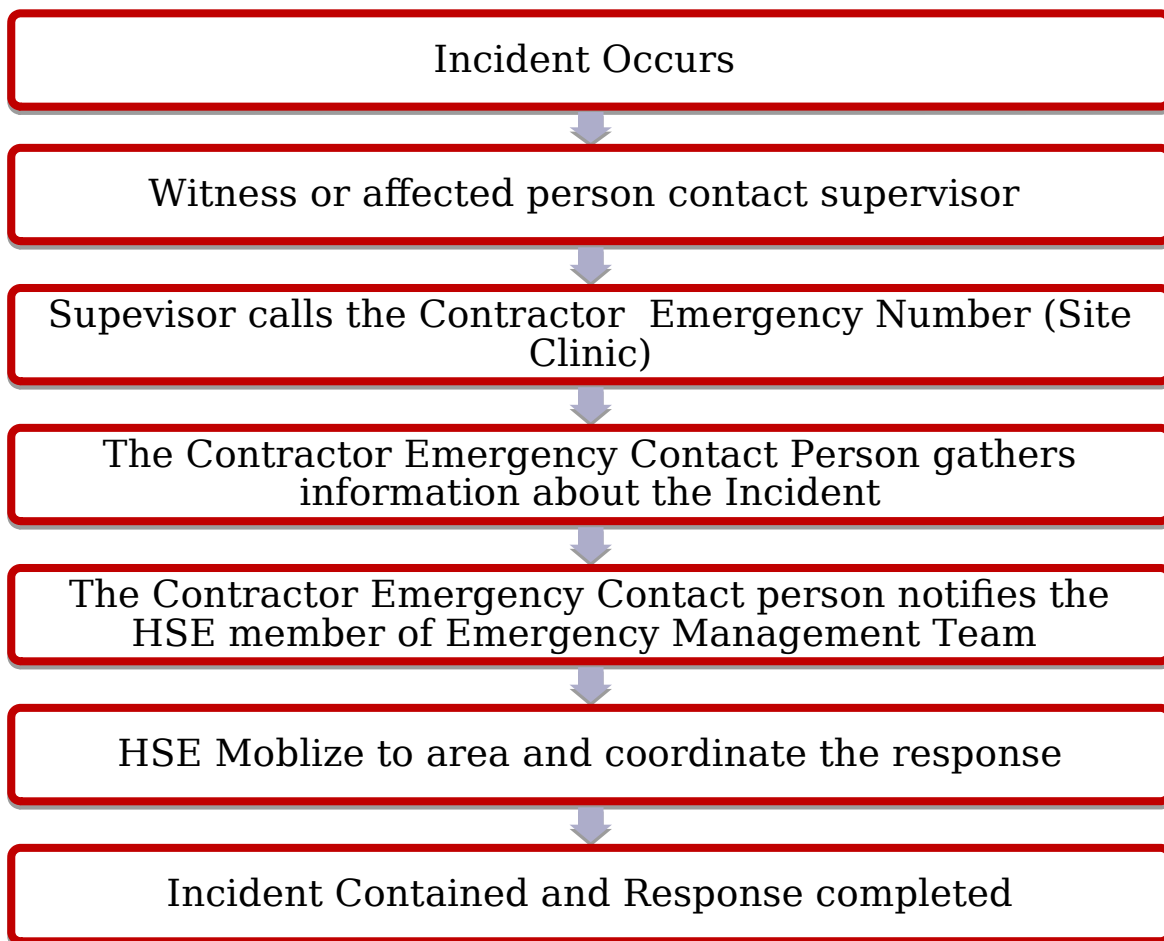
- Establish an effective system for early flood warnings.
- Develop clear evacuation routes and conduct regular drills.
- Maintain a stock of essential supplies like life vests, first aid kits, and emergency lighting.
- Conduct regular flood response training for all site personnel.
- Establish clear communication lines with local emergency services and authorities.
- Implement a plan for damage assessment, site cleanup, and restoration of operations post-flooding.

5.1 Site Personal Response

- Inform the supervisor in the first instance of the emergency event.
- The supervisor is to take immediate action if safe to do so at the accident/incident scene to determine what controls are required to prevent

serious injury, damage, fire spread, or spill control and determine if area evacuation is required.

- The supervisor shall immediately call the emergency response manager (primary contact Site Clinic as per App.03).
- Give clear concise details.
- Do not hang up until clearance is given.
- The Emergency response manager (through EMT and ERT) will manage the event and call the appropriate External Emergency Services if required and JV, Consultant.
- The supervisor or deputy shall inform the Contractor's site management of the accident/incident.
- The emergency response flow chart will be as below:



5.2 Subcontractor's Emergency

Control Organization:

- Each subcontractor shall appoint a warden/deputy warden for their areas of responsibility.
- Each subcontractor shall ensure that the Flood Response Procedure and Emergency contact details (App.01 & App.03) are displayed at appropriate locations and shall regularly induct all personnel regarding behavior in emergencies.

- Each subcontractor shall forward to the Contractor a list and a copy of the current qualification certificates for all employees with first aid, firefighting training, and other specialist emergency training e.g. height rescue (in accordance with the Project HSE Plan).

5.3 Emergency Management

Team

- The Emergency Management Team (EMT) will be in charge of initiating the site evacuation and supervising the required emergency response using internal and (if necessary) external resources. It comprises of the following personnel:

Responsibility	Position	Name and phone number
Declare a state of emergency initiate site evacuation information to Owner declare clearance	Site Manager	TBA
Supervise internal emergency response and supervise external emergency response	HSE Manager	TBA
Assistance as per instructions and requirements of the JV - Management	The subcontractors and Contractors' Management and HSE staff	Subcontractor site manager TBA Subcontractor HSE manager TBA
	Site Security	TBA

- All personnel on site are required to follow the instructions given by the EMT without delay to assist in the emergency response. Tasks may include (but are not limited to) directing emergency services, rescue and firefighting, barricading and securing, etc.

5.4 Natural disaster

preparedness and response

In case a warning for a natural disaster and/or potential deterioration of the security situation is issued by the relevant authorities, the preparation and response to limit the impact on the site will be organized as follows:

- The Subcontractor will call a meeting with the contractor representatives and invite all required persons (Contractors' Site Manager and responsible key personnel, further parties as required). The meeting will be conducted to define the required actions and measures before, during, and after the natural disaster to be taken in addition to the individual Contractor's Disaster Management Plan.
- The defined actions will be implemented by the personnel identified as responsible. All Contractors will cooperate and support as required by allocating the necessary manpower and resources. The responsible person will

report the completion of the measures taken to the Contractor Site Management in addition to the Contractor's management.

- The defined actions will be implemented by the personnel identified as responsible. The subcontractors will cooperate and support as required by allocating the necessary manpower and resources.
- The responsible person will report the completion of the measures taken to the Contractor Site Management.
- After the disaster, the subcontractor will assess all site areas and inform the Contractors regarding the required recovery measures. Priority will be given to measures reestablishing the safety and security of the site.

In case of natural disasters occur without prior warning, the Contractor will initiate a Site Evacuation as per Section 4.5. After the event Item 5 of the above list will proceed.

6.0 TRAINING AND DRILLS

- Schedule frequent training sessions for all site personnel on flood preparedness and emergency response.
- Conduct realistic drills to simulate flood scenarios, ensuring everyone knows their role and actions during an actual flood event.
- Use the outcomes of drills and simulations to identify areas for improvement in the flood control plan.

7.0 COLLABORATION WITH EXTERNAL AGENCIES

- Establish and maintain communication with local emergency management agencies, fire departments, and environmental agencies for support and guidance.
- Inform and engage with the local community, especially if the construction site's flood control measures impact surrounding areas.

8.0 ENVIRONMENTAL CONSIDERATIONS

- Implement flood control measures that minimize environmental impact, such as using sustainable materials for barriers and prioritizing natural drainage solutions.
- Ensure that flood control practices do not adversely affect local flora and fauna.

9.0**APPENDIX****9.1****App.01 Emergency Response****Cards****Flood Emergency on
the Site**

Person	Action
On-scene Person	<ul style="list-style-type: none"> • Contact the ERT Team for help and provide them with the location. • Provide lifesaving first aid. • Assist rescue personnel as needed.
Site Management	<ul style="list-style-type: none"> • Contact the Emergency Team and notify them of the emergency and assign a person to meet the emergency service at the meeting location. • Contact the HSE lead. • Contact the area Manager once the situation is under control. • Establish an Event Investigation Committee consisting of Site Managers, HSE Lead, and Contractors if
HSE management	<ul style="list-style-type: none"> • Mobilize the Emergency Response Team if rescue is required. • Respond to the Flood location and ensure the scene is secured. • Take notes about the Flood event and begin investigation. • Accompany the injured person to the hospital and wait until

9.2

App.02 Station Emergency

Contact Numbers

Station Emergency Contact Detailأرقام الطوارئ بالمشروع		
Titleالمنصب	Nameالاسم	Phone numberرقم التليفون
Internal Contact List:		
Site Manager مدير الموقع	TBA	TBA
Construction Manager مدير الإنشاءات	TBA	TBA
HSE Manager مدير السلامة بالموقع	TBA	TBA
Site First Aid Unit وحدة الإسعافات الأولية بالموقع	TBA	TBA
Emergency Response Team Leader قائد فريق الطوارئ	TBA	TBA
Security Support مسؤول الأمن	TBA	TBA
JV Director مدير التحالف	Sameh Fouad	TBA
JV HSSE Manager مدير السلامة والأمن للتحالف	Hosny Elkady	01050021690
External Contact List:		

Emergency services خدمات الطوارئ	Ambulance الأسعاف	123
	Fire Brigade الأطفاء	180
	Police الشرطة	122
	Hospital المستشفى	TBA
<u>Important phone numbers</u>		
Employer / Engineer Representative مهندس الاستشاري	TBA	TBA
Site Evacuation أخلاء الموقع	Initiation of site evacuation only by the JV Director and the Subcontractor Site Manager or emergency services أخلاء الموقع في حالة الطوارئ يحدده مدير التحالف و مسؤول المقاول او مسؤولي خدمات الطوارئ	

9.3

App.03 project layout



9.4
Emergency layout

Appendix No.: 04 - Station
TBA